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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

Docket No.: 10015867-1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Bradford A. Ritter

Application No.: 09/921,464

Confirmation No.: 7032

Filed: August 3, 2001

Art Unit: 2672

For: SYSTEM AND METHOD FOR PERFORMING TEXTURE SYNTHESIS

Examiner: R. R. Yang

APPELLANT'S BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This brief is in furtherance of the Notice of Appeal, filed in this case on June 23, 2004.

The fees required under § 1.17(f) and any required petition for extension of time for filing this brief and fees therefor, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is transmitted in triplicate.

This brief contains items under the following headings as required by 37 C.F.R. § 1.192 and M.P.E.P. § 1206:

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

Hewlett-Packard Development Company, L.P., a Texas Limited Partnership having its principal place of business in Houston, Texas.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 31 claims pending in this application, which are identified as claims 1-31.

B. Current Status of Claims

1. Claims canceled: None.

2. Claims withdrawn from consideration but not canceled: None.

3. Claims pending: 1-31.

4. Claims allowed: None.

5. Claims rejected: 1-31.

C. Claims On Appeal

The claims on appeal are claims 1-31.

IV. STATUS OF AMENDMENTS

A Final Office Action was mailed March 24, 2004. Applicant filed a Response After Final Action on May 24, 2004, in which no amendments were presented. An Advisory Action was mailed June 14, 2004. Accordingly, the claims enclosed herein as Appendix A are as those claims were pending at the time of the Final Office Action.

V. SUMMARY OF INVENTION

In one embodiment, a method for synthesizing a texture of a desired size from a sample texture is provided. The method comprises the steps of generating a matrix of the desired size, and providing values to the matrix. The values include random values and at least a portion of the values represents a desired structure according to which graphical features of a synthesized texture are to substantially conform. The method further comprises executing a texture synthesis process that utilizes the matrix to generate a synthesized texture of the desired size having graphical features arranged therein substantially in conformance with the desired structure. *See* paragraph [0013] on page 5 of the present application.

By including not only random values in the matrix, but also values that represent a desired structure according to which features of a synthesized texture are to substantially conform, embodiments provided by the present application enable the matrix to be processed to generate a synthesized texture that maintains graphical features arranged in conformance with a desired structure, *see* paragraph [0032] on page 9 of the present application. When processing a sample texture that has features that occur as a repeating geometric structure, previous texture synthesis algorithms, such as that of *Wei*, generally produce a result that does not maintain such repeating geometric structure, *see* paragraph [0027] on page 7 of the present application; *see also* paragraphs [0028]-[0030] of the present application, which describes in conjunction with FIGURE 2 of the present application an example of the *Wei* technique processing a sample texture that includes graphical features (i.e., diamonds) arranged according to a desired structure (i.e., rows and columns) wherein the resulting synthesized texture does not maintain the structure of the graphical features very well. Great emphasis has traditionally been placed on the randomness of the texture synthesis process, *see* paragraph [0031] of the present application.

In certain embodiments provided by the present application, the randomness of a noise texture is tempered in a manner to enable a desired structure of graphical features appearing in the sample texture to be maintained in the resulting synthesized texture, *see* paragraphs [0031]-[0034] of the present application. For instance, in one implementation, constant values are included, along with random noise values, in a matrix to aid in maintaining a desired structure of graphical features, *see* paragraph [0035] on page 10 of the present application; *see also* FIGURE 4 and corresponding discussion thereof in the present application, wherein solid lines in the matrix 402 represent values defining a desired structure according to which graphical features of a synthesized texture are to substantially conform (i.e., rows in this example) and the remainder of the matrix 402 is random values.

VI. ISSUES

The issues remaining are:

A. Whether claims 1-10, 14, 17-20, 23, 25, and 27-31 are anticipated under 35 U.S.C. § 102(a) by SIGGRAPH 2000 Conference Proceedings pg. 479-488 by Wei et al. (hereinafter "*Wei*");

B. Whether claims 11-12 and 21-22 are unpatentable under 35 U.S.C. § 103(a) over *Wei*;

C. Whether claim 13 is unpatentable under 35 U.S.C. § 103(a) over *Wei* in view of U.S. Patent No. 6,232,981 to Gossett (hereinafter "*Gossett*"); and

D. Whether claims 15, 16, 24, and 26 are unpatentable under 35 U.S.C. § 103(a) over *Wei* in view of U.S. Patent No. 4,601,055 to Kent (hereinafter "*Kent*").

VII. GROUPING OF CLAIMS

For purposes of this supplemental appeal brief only, and without conceding the teachings of any prior art reference, the claims have been grouped as indicated below:

Group Claim(s)
I. Claims 1, 4-10, 12-18, 20, 22, 25-27, and 29-31;
II. Claims 2-3, 19, and 28;
III. Claims 11 and 21; and
IV. Claim 23.

In Section VIII below, Applicant has included arguments supporting the separate patentability of each claim group as required by M.P.E.P. § 1206.

VIII. ARGUMENTS

I. Rejections under 35 U.S.C. § 102(a) over *Wei*

Claims 1-10, 14, 17-20, 23, 25, and 27-31 stand rejected under 35 U.S.C. § 102(a) as being anticipated by *Wei*. To anticipate a claim under 35 U.S.C. § 102, a single reference must teach every element of the claim, *see* M.P.E.P. § 2131. Appellant respectfully submits that *Wei* fails to teach each and every element of claims 1-10, 14, 17-20, 23, 25, and 27-31, as discussed further below.

Wei fails to teach every element of independent claims 1, 17, and 27. For instance, independent claim 1 recites:

> generating a matrix of said desired size;
> providing values to said matrix, wherein said values comprise random values and wherein at least a portion of said values represents a desired structure according to which graphical features of a synthesized texture are to substantially conform; and
> executing a texture synthesis process that utilizes said matrix to generate a synthesized texture of said desired size having graphical features arranged therein substantially in conformance with said desired structure. (Emphasis added).

Independent claim 17 recites:

> a first data structure defining said sample texture of a first plurality of values;
> a second data structure defining a texture of a second plurality of values, wherein at least a portion of said values of said second data structure are random and wherein at least a portion of said values of said second data structure represent a desired structure according to which graphical features are to substantially conform; and
> a texture synthesis algorithm, said texture synthesis algorithm being operable to utilize at least said first data structure and said second data structure to generate a synthesized texture having graphical features arranged therein in substantial conformance to said desired structure. (Emphasis added).

Independent claim 27 recites:

> code for generating a matrix of said desired size;
> code for initializing said matrix with a plurality of values, wherein at least a portion of said values are random and wherein at least a portion of said values represent a desired structure according to which graphical features are to be arranged; and
> code for generating a synthesized texture of said desired size having graphical features arranged therein according to said desired structure.
> (Emphasis added).

As discussed in the specification of the present application (*see e.g.*, paragraphs 0027-0033), Appellant respectfully submits that *Wei* does not teach at least the above-emphasized elements of independent claims 1, 17, and 27.

More particularly, *Wei* fails to teach a matrix that is used in its texture synthesis process which includes both random values and values that represent a desired structure. As explained further below, *Wei* describes an initial matrix that is used in its synthesis process, which includes random white noise. However, this initial matrix does not include values that represent a desired structure. As also explained below, at a later stage in the operation of *Wei*'s texture synthesis process the matrix includes synthesized, low-resolution image values. At this stage, such matrix does not include random values, but instead has the synthesized low-resolution image values. Again, no matrix is provided in *Wei* that includes both random values and values that represent a desired structure.

With regard to independent claims 1, 17, and 27, the Final Office Action asserts that the "examiner notes Gs is a Gaussian matrix, therefore the elements are random values (page 481 section 2), and since Gs is built from Is, it is substantially conformed to a desired structure (see 2.3)." Page 14 of Final Office Action. Thus, the Final Office Action appears to contend that *Gs* of *Wei* provides a matrix of a desired size, where such *Gs* contains random values. Further, the Final Office Action further contends that because *Gs* is built from *Is*, at least a portion of the values of *Gs* represent a desired structure according to which graphical features of a synthesized texture are to substantially conform. Appellant respectfully disagrees, as discussed below.

Wei is directed to a texture synthesis algorithm. Section 2 of *Wei* first describes how the texture synthesis algorithm works in a single resolution (section 2.1), and then describes

how to extend this algorithm using a multiresolution pyramid to obtain improvements in computational efficiency (section 2.3). In section 2.1, *Wei* describes that the texture synthesis algorithm receives an input texture sample *Ia* and a white random noise *Is*. The texture synthesis algorithm forces the random noise *Is* to look like *Ia* by transforming *Is* pixel by pixel in a raster scan ordering. To determine a given pixel value *p* in *Is*, the given pixel's spatial neighborhood *N(p)* is compared against all possible neighborhoods *N(pi)* from *Ia*. The input pixel *pi* with the most similar *N(pi)* is assigned to *p*.

In this single-resolution instance, the white random noise matrix *Is* that is processed in the above manner to look like *Ia* does not include any values therein that represent a desired structure according to which graphical features of the synthesized texture are to substantially conform. Rather, *Is* of *Wei* merely contains random noise values, such as in the middle image of Figure 1 of *Wei*. Thus, the texture synthesis algorithm for the single resolution does not teach at least the above-emphasized elements of independent claims 1, 17, and 27.

In section 2.3, *Wei* proposes an extension to multiresolution synthesis. As *Wei* explains:

> The single resolution algorithm captures the texture structures by using adequately sized neighborhoods. However, for textures containing large scale structures we have to use large neighborhoods, and large neighborhoods demand more computation. This problem can be solved by using a multiresolution image pyramid [3]; computation is save because we can represent large scale structures more compactly by a few pixels in a certain lower resolution pyramid level.

Thus, *Wei* describes that a major advantage of multiresolution synthesis is that "moderately small neighborhoods can be used without sacrificing synthesis qualities." Section 2.3 of *Wei*. In describing the multiresolution synthesis technique, *Wei* provides:

> Two Gaussian pyramids, *Ga* and *Gs*, are first built from *Ia* and *Is*, respectively. The algorithm then transforms *Gs* from lower to higher resolutions, such that each higher resolution level is constructed from the already synthesized lower resolution levels. This is similar to the sequence in which a picture is painted: long and thick strokes are placed first, and details are then added. Within each output pyramid level *Gs(L)*, the pixels are synthesized in a way similar to the single resolution case where the pixels are assigned in a raster scan ordering. The only modification is that for the multiresolution case, each neighborhood *N(p)* contains pixels in the current resolution as well as those in the lower resolutions. (Emphasis added).

Thus, the *Gs* pyramid is transformed from lower to higher resolutions, where each higher resolution level is constructed from the already synthesized lower resolution levels using the neighborhood processing technique for each pixel. The initial level (matrix) of the *Gs* pyramid does not include values therein that represent a desired structure according to which graphical features of the synthesized texture are to substantially conform. Rather, *Gs* is built from *Is*, which, as described above in *Wei*, is random white noise. *Ga* is built from *Ia*, which, as described above, is the input texture sample. Thus, initially *Gs* contains white random noise, just as *Is* initially includes white random noise in the above-described single resolution case. Accordingly, the first-level matrix of the *Gs* pyramid of *Wei* does not include any values therein that represent a desired structure according to which graphical features of the synthesized texture are to substantially conform.

During operation of the multiresolution synthesis algorithm, *Ga* and *Gs* are used in the synthesis algorithm in a manner similar to the use of *Ia* and *Is* in the above-described single resolution technique. Indeed, *Wei* states that the only modification to the single resolution algorithm for the multiresolution case is that each neighborhood *N(p)* contains pixels in the current resolution as well as those in the lower resolutions. *Wei* explains that these "lower resolution pixels constrain the synthesis process so that the added high frequency details will be consistent with the already synthesized low frequency structures." Section 2.3 of *Wei*. Again, the purpose of *Wei's* multiresolution technique is to permit higher resolution textures to be synthesized with use of moderately small neighborhoods.

Accordingly, during operation of the multiresolution synthesis algorithm, a first level matrix of low resolution is generated in the *Gs* pyramid using the neighborhood approach. For example, a first level matrix of low resolution that may be generated in shown in Figure 7(a) of *Wei*. This first level (low resolution texture) is then used, rather than the white random noise matrix (initial level of the *Gs* pyramid), to generate a second level of higher resolution, such as the higher-resolution second level matrix of Figure 7(b) of *Wei*. In turn, this second level matrix may be used to generate an even higher-resolution third matrix, such as the third level matrix of Figure 7(c) of *Wei*.

Of course, the matrices used in the above-described stages of operation of *Wei's* synthesis algorithm do not contain random values. Rather, such matrices (e.g., of Figures 7(a)-(c) of *Wei*) each includes a synthesized texture at progressively higher resolutions. For

instance, the first level low-resolution matrix (e.g., matrix of Figure 7(a)) includes synthesized image values at low-resolution, and does not include any random values. As described above, such low-resolution first level is processed to generate a higher-resolution second level matrix of the *Gs* pyramid. This is what enables the pyramid approach of *Wei* to progressively improve resolution at each level of the pyramid. It is unclear how (if at all) the resolution could be progressively improved in *Wei* if the matrices at each level of the pyramid included random values.

In view of the above, the *Gs* pyramid initially (e.g., the initial "level" of the pyramid) provides a matrix that contains random white noise, and does not include any values that represent a desired structure. Each higher level of the *Gs* pyramid provides a matrix that contains synthesized texture image values at progressively higher resolution, and do not include any random values. Accordingly, at no level does the *Gs* pyramid of *Wei* include a matrix having <u>both</u> random values and values that represent a desired structure.

In response to the above arguments, the Examiner asserted in the Advisory Action mailed June 14, 2004 that "Wei discloses 'We force the random noise Is to look like Ia' (page 481, 2.1, line 2)." Page 2 of Advisory Action. The Examiner concludes that "[t]herefore, Is becomes pseudo-random but has similar structure of Ia." Page 2 of Advisory Action. Appellant strenuously disagrees and submits that, as clearly explained above, at no point does the *Is* matrix (nor any other matrix of *Wei*) include <u>both</u> random values and values that represent a desired structure. The *Is* values are initially all random white noise, and are processed to result in a matrix of synthesized values (none of which are random, but are instead all resulting from the synthesis process). Thus, again, at no point does the *Is* matrix of *Wei* include both random values and values that represent desired structure.

In view of the above, *Wei* fails to teach each and every element of independent claims 1, 17, and 27. As such, independent claims 1, 17, and 27 are not anticipated under 35 U.S.C. § 102(a) by *Wei*. Further, dependent claims 2-10, 14, 18-20, 23, 25, and 28-31 stand rejected under 35 U.S.C. § 102(a) as being anticipated by *Wei*. Each of dependent claims 2-10, 14, 18-20, 23, 25, and 28-31 depend either directly or indirectly from one of independent claims 1, 17, and 27, and thus inherit all limitations of the respective independent claim from which they depend. It is respectfully submitted that dependent claims 2-10, 14, 18-20, 23, 25, and 28-31 are allowable not only because of their dependency from their respective independent

claims for the reasons discussed above, but also in view of their novel claim features (which both narrow the scope of the particular claims and compel a broader interpretation of the respective base claim from which they depend).

As such, Appellant respectfully requests that the rejections of claims 1-10, 14, 17-20, 23, 25, and 27-31 as being anticipated under 35 U.S.C. § 102(a) by *Wei* be overturned. The above arguments apply to the claims of Groups I-V identified above.

Further, dependent claim 2 recites "providing constant values to said matrix that represent said desired structure." Dependent claim 3 recites "providing constant values to said matrix that are arranged therein to represent said desired structure." Dependent claim 19 recites "constant values arranged in said second data structure to represent said desired structure." And, dependent claim 28 recites "code for providing constant values to said matrix arranged therein to identify said desired structure." *Wei* fails to teach at least these elements of claims 2, 3, 19, and 28. For instance, at no point does the *Is* matrix of *Wei* include <u>both</u> random values and constant values that represent a desired structure. Thus, dependent claims 2, 3, 19, and 28 are not anticipated by *Wei* for these further reasons. These arguments apply to the claims of Group II identified above.

Additionally, dependent claim 23 recites "wherein said texture synthesis algorithm is operable to transform said second data structure into said synthesized texture." *Wei* fails to teach this further element of claim 23. For instance, as the Examiner notes, *Wei* processes matrix *Is* that is initially formed of white noise to generate synthesized texture. However, *Wei* does not transform a data structure that comprises <u>both</u> random values and values that represent a desired structure into a synthesized texture. Rather, the values of the *Is* matrix that is transformed in *Wei* consists solely of random white noise. Thus, dependent claim 23 is not anticipated by *Wei* for this further reason. This argument applies to the claim of Group IV identified above.

II. Rejections Under 35 U.S.C. § 103(a)

Claims 11-12 and 21-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Wei*. Additionally, claim 13 is rejected under 35 U.S.C. § 103(a) as being unpatentable

over *Wei* in view of *Gossett*. Further, claims 15, 16, 24, and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Wei* in view of *Kent*.

Each of dependent claims 11-13, 15, 16, 21-22, 24, and 26 depends, either directly or indirectly, from one of independent claims 1 and 17 (and thus inherits all limitations of its respective independent claim). In view of the above, Applicant respectfully submits that independent claims 1 and 17 are of patentable merit. It is respectfully submitted that dependent claims 11-13, 15, 16, 21-22, 24, and 26 are allowable at least because of their dependency from their respective independent claims for the reasons discussed above.

Further, dependent claim 11 recites "wherein said sample texture comprises a parametric texture map (PTM) texture." Similarly, dependent claim 21 recites "wherein said sample texture comprises a parametric texture map (PTM) texture." The Examiner recognizes in the Final Office Action that "Wei does not explicitly disclose said sample texture comprises a parametric texture map (PTM) texture", but asserts in the Final Office Action that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to extend the method to parametric texture map in order to synthesize a well known sub-class of texture map." Page 9 of the Final Office Action. Appellant respectfully disagrees and submits that neither *Wei* nor any other reference applied by the Examiner teaches or suggests that the synthesis technique of *Wei* can be utilized with PTM textures or how *Wei*'s synthesis technique would be adapted for use with PTM textures. As explained in the specification of the present application at paragraph [0048]:

> Further, preferred embodiments of the present invention differ from the Wei and Levoy algorithm [i.e., the *Wei* reference applied by the Examiner] in several pertinent respects due to the unique characteristics of PTM textures. For example, it shall be appreciated that the representation of the visual information in a PTM texture is significantly different from the representation of visual information in the textures described in the Wei and Levoy article discussed above. Specifically, the textures synthesized in the Wei and Levoy article do not vary as a function of incident light direction. The comparison of neighborhoods [in *Wei*] relies on this simple representation of visual information. Accordingly, it is not possible to simply provide a PTM texture as the input texture in the Wei and Levoy synthesis algorithm to generate a synthesized PTM texture.

In view of the above, no motivation exists for utilizing a PTM texture in the *Wei* synthesis algorithm as the *Wei* algorithm, as taught, is not capable of receiving such a PTM

texture as an input texture. Accordingly, use of a parametric texture map (PTM) texture as recited by claims 11 and 21 is not obvious under 35 U.S.C. § 103(a) over *Wei*. This argument applies to the claims of group III identified above.

III. Conclusion

For the reasons advanced above, Appellant respectfully submits that claims 1-31 are of patentable merit. Therefore, reversal of the outstanding rejections is courteously solicited.

IX. CLAIMS INVOLVED IN THE APPEAL

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

Applicant believes no fee is due with this response. However, if a fee is due, please charge Deposit Account No. 08-2025, under 10015867-1 from which the undersigned is authorized to draw.

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail, Label No. EV 255078637US in an envelope addressed to: M/S Appeal Brief - Patents, Commissioner for Patents, Alexandria, VA 22313.

Date of Deposit: August 13, 2004

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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 09/921,464

1. A method for synthesizing a texture of a desired size from a sample texture, said method comprising:

generating a matrix of said desired size;

providing values to said matrix, wherein said values comprise random values and wherein at least a portion of said values represents a desired structure according to which graphical features of a synthesized texture are to substantially conform; and

executing a texture synthesis process that utilizes said matrix to generate a synthesized texture of said desired size having graphical features arranged therein substantially in conformance with said desired structure.

2. The method of claim 1 wherein said providing comprises:

providing constant values to said matrix that represent said desired structure.

3. The method of claim 1 wherein said providing comprises:

providing constant values to said matrix that are arranged therein to represent said desired structure.

4. The method of claim 1 wherein said providing comprises:

populating said matrix with values from a pre-existing file.

5. The method of claim 4 further comprising:

randomizing said values from said pre-existing file.

6. The method of claim 5 wherein said randomizing further comprises:

randomizing said values from said pre-existing file to a user-specified degree.

7. The method of claim 4 wherein said values from said pre-existing file are nearly the desired result but are not tileable.

8. The method of claim 4 wherein said values from said pre-existing file include said at least a portion of values that represent said desired structure, but wherein said matrix having values from said pre-existing file is not readily tileable.

9. The method of claim 1 wherein said executing said texture synthesis process further comprises:

(a) selecting a value from said matrix;

(b) determining a first neighborhood of the selected value from said matrix; and

(c) comparing said first neighborhood to neighborhoods of said sample texture to determine an optimal value of said sample texture.

10. The method of claim 9 further comprising:

(d) repeating (a)-(c) for each value of said matrix.

11. The method of claim 1 wherein said sample texture comprises a parametric texture map (PTM) texture.

12. The method of claim 11 wherein said providing comprises:

providing texel values to said matrix.

13. The method of claim 1 wherein said sample texture comprises a texture of a format selected from the group consisting of:

red-green-blue (RGB), red-green-blue-alpha (RGBA), color index, luminance, and luminance alpha.

14. The method of claim 1 wherein said providing comprises providing pixel values to said matrix.

15. The method of claim 1 further comprising re-sizing said synthesized texture.

16. The method of claim 1 wherein said desired size is not a power of 2, further comprising:

re-sizing said synthesized texture to a size that is a power of 2.

17. A system for generating a synthesized texture from a sample texture, said system comprising:

a first data structure defining said sample texture of a first plurality of values;

a second data structure defining a texture of a second plurality of values, wherein at least a portion of said values of said second data structure are random and wherein at least a portion of said values of said second data structure represent a desired structure according to which graphical features are to substantially conform; and

a texture synthesis algorithm, said texture synthesis algorithm being operable to utilize at least said first data structure and said second data structure to generate a synthesized texture having graphical features arranged therein in substantial conformance to said desired structure.

18. The system of claim 17 wherein said first data structure is of a first size and wherein said second data structure is of a second size.

19. The system of claim 17 wherein said at least a portion of said values of said second data structure comprises:

constant values arranged in said second data structure to represent said desired structure.

20. The system of claim 17 wherein said second data structure is populated with values from a pre-existing file comprising said at least a portion of said values that identify said desired structure.

21. The system of claim 17 wherein said sample texture comprises a parametric texture map (PTM) texture.

22. The system of claim 21 wherein said first plurality of values comprise texel values.

23. The system of claim 17 wherein said texture synthesis algorithm is operable to transform said second data structure into said synthesized texture.

24. The system of claim 23 wherein said second data structure has a size that is not a power of 2, and wherein said texture synthesis algorithm is further operable to re-size said synthesized texture to a size that is a power of 2.

25. The system of claim 17 wherein said texture synthesis algorithm is further operable to select a value from said second data structure, determine a first neighborhood of the selected value from said second data structure, compare said first neighborhood to neighborhoods of said first data structure to determine an optimal value of said first data structure, and assign said optimal value to the selected value of said second data structure.

26. The system of claim 17 wherein said texture synthesis algorithm is further operable to re-size said synthesized texture.

27. A system for synthesizing a texture of a desired size from a sample texture, said system comprising:

code for generating a matrix of said desired size;

code for initializing said matrix with a plurality of values, wherein at least a portion of said values are random and wherein at least a portion of said values represent a desired structure according to which graphical features are to be arranged; and

code for generating a synthesized texture of said desired size having graphical features arranged therein according to said desired structure.

28. The system of claim 27 wherein said code for initializing said matrix further comprises:

code for providing constant values to said matrix arranged therein to identify said desired structure.

29. The system of claim 27 wherein said code for initializing said matrix further comprises:

code for populating said matrix with values from a pre-existing file.

30. The system of claim 27 wherein said code for generating comprises:

code for transforming at least a portion of said values of said matrix such that said matrix defines said synthesized texture.

31. The system of claim 27 wherein said code for generating further comprises:

code for determining a first neighborhood of a selected value from said matrix;

code for comparing said first neighborhood to neighborhoods of said sample texture to determine an optimal value of said sample texture; and

code for assigning said optimal value of said sample texture to the selected value of said matrix.